FLIGHT AND OPERATORS MANUAL

Ultralight Aircraft **IKARUS** C 42

Issued: Febuary 2012

This Flight Manual belongs to aircraft

Type **IKARUS** C 42 B

Registration No. _____

Serial-No. _____

Manufacturer

COMCO IKARUS GmbH
Leichtflugzeuge
Am Flugplatz 11
D-88367 Hohentengen
Germany

Owner _____

_____

_____

This handbook is to be kept in the aircraft at all times.

The described options of use for the C42B are certified for Germany and have been tested in Germany.
Please note that for using the C42B as a towplane for towing gliders, towing aerial signs or decanting sky divers, different regulations may apply in different countries. Please contact your local authorities for further clarification.

Index

Page

Title page -
Table of contents -
Correction status 1
3-side view 2
Introductory remarks 3

1 Operating limitations....4

1.1 Airspeeds:....4
1.2 Weights....4
1.3 Structural limitations:....4
1.4 Center of gravity limits:....4
1.5 Airspeed markings:....4
1.6 Engine rpm limitations....5
1.7 Rpm indicator markings Yellow arc: n = 5500 - 5800 rpm....5
1.8 Flap settings....5
1.9 Propellers for Rotax 912 UL:....5
1.10 Propeller s for Rotax 912 UL S....7
1.11 Engine limitations according to the Rotax operating manual....8

2 Kinds of operation limitations....9

3 Operation of the Engine....9

4 Flight Operations....10

4.1 Taxiing:....10
4.2 Take-off and climb:....10
4.3 Cruising flight....12
4.4 Turning flight....12
4.5 Stalls....13
4.6 Descent and landing....13
4.7 Shutting down the engine:....14
4.8 Sudden loss of engine power:....14
4.9 Emergency procedures....16

Index

Page

5 Ground Handling 17

5.1 Towing 17
5.2 Hoisting 17
5.3 Parking 17
5.4 Tie-Down 18

6 Minimum equipment 19

7 Dimensions 19

8 Weight and balance 20

9 Data placard and checklist: 23

10 "Before take-off" checklist 24

11 Equipment 25

12 Flight performance: 27

12.1 Take-off distance 27
12.2 Climb performance 27
12.3 Cruise performance (solo) 28
12.4 Engine off performance 28

13 Attaching the wings 29

13.1 to the folding mechanism 29
13.2 Attaching the wings to the fuselage 30
13.3 Folding the wings for hangaring 32

14 Pre-flight inspection 33

15 Care and maintenance 36

16 Rigging data 38

17 Information for ultralights with towing gear 41

17.1 Necessary equipment for towing aircraft 41

Index

Page

17.2 Operating limitations 42
17.3 Flight characteristics and performance 44
17.4 Placards 45
17.5 Emergency procedures during towing 46

18 Inspection and maintenance intervals 48

19 Special features of aircraft equipped for handicapped pilots 53

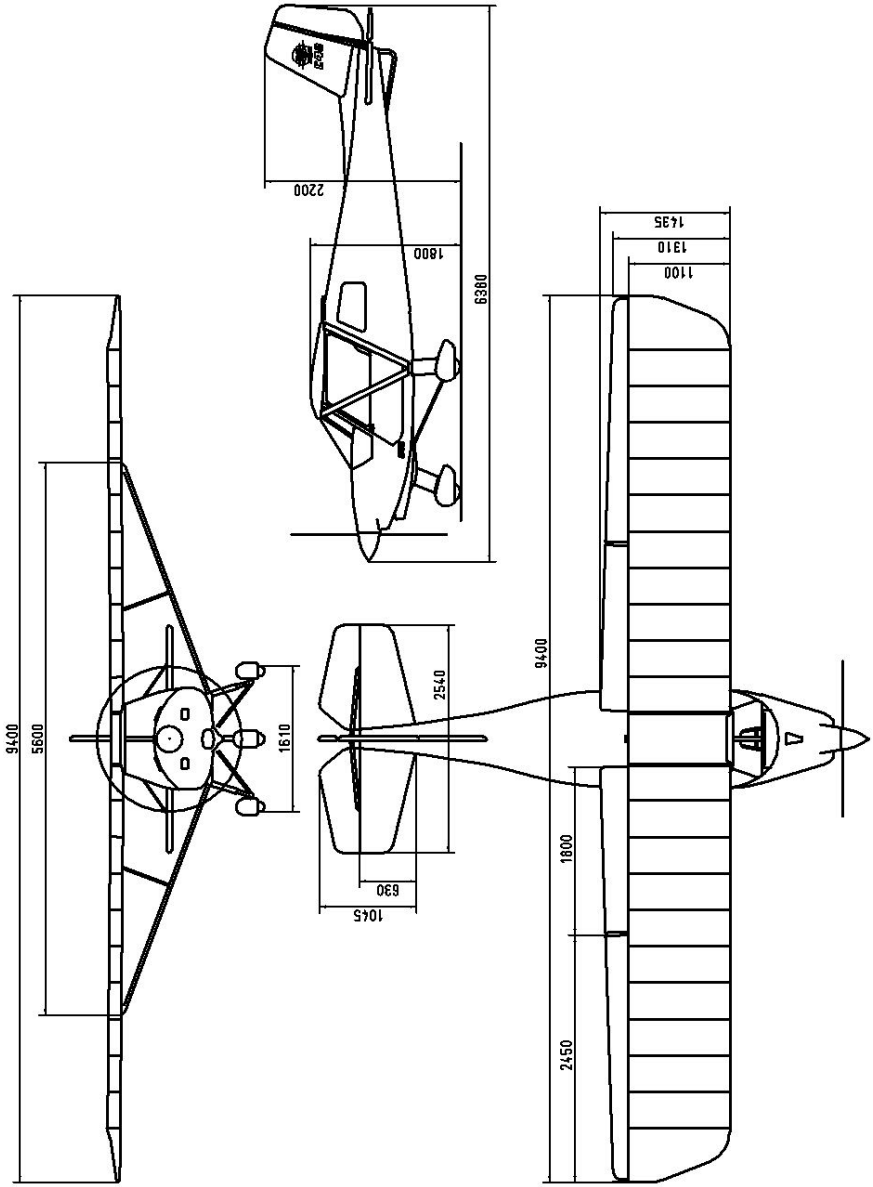
20 Flying the IKARUS C42 Series with doors removed 55

21 Additional instructions for dropping parachutists from the IKARUS C42 Series 56

22 Comco Ikarus Warranty 58

Febuary 2012

Amendments				
No.	Description	Page	Date	Signature
1	Completely revised	All	Mai 2010	A.Kurz
2	Care and maintenance	32	October 2010	A.Kurz
3	Graphics	Appendix Page 5	January 2011	A.Kurz
4	Warranty	54 - 57	January 2011	A.Kurz
5	Ground Handling	16-17	August 2011	A.Kurz
-	Index new formatted	16-17	August 2011	A.Kurz
6	Helix Prop. / RS	6-7 25-26	Febuary 2012	A.Kurz
7	Control surface deflections	39	Febuary 2012	A.Kurz


2200
1800
6380
1435
1310
1100
9400
5600
1610
2540
630
1045
1800
2450

Introductory remarks

This ultralight aircraft has been built in compliance with the airworthiness requirements for ultralight aircraft and has been certified in Germany.

To operate this aircraft the pilot needs a minimum of at least a SPL (Sport Pilot Licence) or, in the case of Austria, a valid licence issued by the Austro Control GmbH.This aircraft is not to be flown unless it is registered and conforms to the relevant air traffic and aviation regulations for ultralight aircraft.

This aircraft is to be operated only from approved airfields.

approved instructor prior to flying this aircraft as it possesses characteristics that are unique to ultralight type aircraft.

Ultralight engines are not certified as aviation engines. The flight path must therefore be chosen to ensure that a landing can be undertaken without risk should an engine failure in flight materialise.

Unauthorised alterations to the control system, structure, wings and engine are prohibited.

All in-service problems and equipment failures are to be reported to the manufacturer or the appropriate national authority.

For fire safety reasons, smoking is prohibited on board the aircraft.

May 2010

1 Operating limitations

1.1 Airspeeds:

Never-exceed speed: 116 kts (216 km/h)
Speed in turbulent air: V_B = 180 km/h
Maximum manoeuver speed: V_A = 139 km/h
Stall speed: flap position 1: V_{S1} = 75 km/h
flap position 2: V_{S2} = 70 km/h
flap position 3: V_{S3} = 65 km/h (35 kts)

During speeds exceeding V_A only little rudder movements are allowed.

1.2 Weights

Empty weight: cf. current weighing record
Maximum take-off weight: 1041 lbs (472.5 kg)
Maximum payload: cf. page 18
Minimum payload: 144 lbs (65 kg)

1.3 Structural limitations:

Positive limit load factor: +4 g
Negative limit load factor: -2 g

1.4 Center of gravity limits:

Reference datum: Wing leading edge at a rib station
Forward center of gravity: 11.8 inches aft of datum (300 mm).
Rearward center of gravity: 20.4 inches aft of datum (520 mm).

1.5 Airspeed markings:

White arc:	38 - 57 kts	(71 - 105 km/h)
Green arc:	43 - 97 kts	(79 - 180 km/h)
Yellow arc:	97 - 116 kts	(180 - 216 km/h)
Yellow triangle:	V_X = 51 kts	(95 km/h)
Yellow line:	V_A = 75 kts	(139 km/h)
Red line:	V_{NE} = 116 kts	(216 km/h)

The deviation curve for the airspeed indicator can be interpolated from the following table

IAS km/h	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
EAS km/h	65	74	83	91	100	109	117	125	134	142	151	160	168	177	185

1.6 Engine rpm limitations

Maximum engine rpm: n = 5800 rpm, 5 min. max
Maximum continuous rpm: n = 5500 rpm

1.7 Rpm indicator markings

Yellow arc:	n = 5500 - 5800 rpm
Red line:	n = 5800 rpm

1.8 Flap settings

Position 1:	cruising
Position 2:	take-off / landing
Position 3:	landing

1.9 Propellers for Rotax 912 UL:

With propeller WARP DRIVE 2-blade 68" (1.72 m Ø) constant speed,
pitch 23.5° at 15.75 inches (0.40 m) from hub,
full throttle rpm on the ground max. 5450 1/min
Propeller rpm approx. n = 2400 1/min

With propeller WARP DRIVE 3-blade 68" (1.72 m Ø)
pitch 21.0° at 15.75 inches (0.40 m) from hub,
full throttle rpm on the ground max. 5200 1/min
Propeller rpm approx. n = 2300 1/min

With propeller Sport-Prop 3-blade 68" (1.72 m Ø)
pitch 19.5° at 15.75 inches (0.40 m) from hub,
full throttle rpm on the ground max. 4900 1/min
Propeller rpm approx. n = 2150 1/min

With propeller GSC 3-blade 68" (1,72 m Ø)
pitch 21.0° at 15.75 inches (0.40 m) from hub,
full throttle rpm on the ground max. 4900 1/min
Propeller rpm approx. n = 2150 1/min

With propeller Neuform CR2-75 2-blade 69” (1,75 m Ø)
pitch 27.0° at r = 14.37 inches (0.365 m),

full throttle rpm on the ground	max. 5100	1/min
Propeller rpm	approx. n = 2250	1/min

With propeller Neuform CR3-75 3-blade 69” (1,75 m Ø)
pitch 24.0° at r = 14.37 inches (0.365 m),

full throttle rpm on the ground	max. 4800	1/min
Propeller rpm	approx. n = 2100	1/min

With propeller Kiev Prop BB 263/1700 3-blade (1,71 m Ø)
Pitch 22,0° at r = 0,4 m from hub,

full throttle rpm on the ground	max. 4800	1/min
propeller rpm	approx. n = 2100	1/min

With propeller Helix H50F-1,75m-R-SI-12-3 3-blade (1,75 m Ø),
Pitch. 16.0° at r = 656 mm

full throttle rpm on the ground	max. 4880	1/min
propeller rpm	approx. n = 2150	1/min

Febuary 2012

1.10 Propeller s for Rotax 912 UL S

With propeller WARP DRIVE 3-blade 68” (1,72 m Ø)
pitch 25.0° at 15.75 inches (0.40 m) from hub,

full throttle rpm on the ground	max. 5200	1/min
Propeller RPM	approx. n =2150	1/min

With propeller GSC 3-blade 68” (1,72 m Ø)
pitch 25.0° at 15.75 inches (0.40 m) from hub,

full throttle rpm on the ground	max. 4900	1/min
Propeller rpm	approx. n = 2000	1/min

With propeller Neuform CR3-75 3-blade 69” (1,75 m Ø)
pitch 27.0° at r = 14.37 inches (0.365 m),

full throttle rpm on the ground	max. 4800	1/min
Propeller rpm	approx. n = 2000	1/min

With propeller Neuform CR3-V-R2H 3-blade 69” (1,75 m Ø), adjustable
pitch 16° - 30° at r = 29.53 inches (0.75 m),

full throttle rpm on the ground	max. 4200 - 5600	1/min
Propeller rpm	approx. n = 1700 - 2300	1/min

With propeller Kiev Prop BB 283/1800 3-blade (1,80 m Ø)
Pitch 24,0° at r = 0,4 m from hub,

full throttle rpm on the ground	max. 4850	1/min
propeller rpm	approx. n = 2000	1/min

With propeller Helix H50F-1,75m-R-S-14-3 3-blade (1,75 m Ø),
Pitch 17.0° bei r = 656 mm

full throttle rpm on the ground	ca. 4480	1/min
propeller rpm	ca. n = 1975	1/min

1.11 Engine limitations according to the Rotax operating manual

	ROTAX 912	ROTAX 912S
Take-off (5 mins)	81 hp / 5800 rpm	100 hp / 5800 rpm
Continuous	79 hp / 5500 rpm	95 hp / 5500 rpm
75%	59 hp / 5000 rpm	69 hp / 5000 rpm
65%	51 hp / 4800 rpm	61 hp / 4800 rpm
55%	43 hp / 4300 rpm	51 hp / 4300 rpm

Type of oil	automotive oils (API SF or SG)	
Amount of oil	min 0.57 imp. gallons (2.6 l) max 0.67 imp. gallons (3.05 l)	
Oil temperatur	min 122°F (50°C) max 284°F (140°C)	min 122°F (50°C) max 266°F (130°C)
optimum	194°-230°F (90°-110°C)	194°-230°F (90°-110°C)
Oil pressure:	normal operating pressure 29 - 72 psi (2 - 5 bar) (cold start 101.45 psi/7 bar)	
Fuel:	Euro-Super ROZ 95 unleaded (DIN 51603) Super Plus ROZ 98 unleaded (DIN 51607) AVGAS 100 LL	
Fuel pressure	2.17 - 5.80 psi (0.15 - 0.4 bar)	
Cylinder head temp.	max. 302°F (150°C) optimum 230°F (110°C)	max. 275°F (135°C) optimum 230°F (110°C)
Magneto check	at 4000 rpm	
rpm drop	max. 300 rpm	

2 Kinds of operation limitations

- Aerobatics and manoeuvres with more than 60° bank are prohibited
- Day light, VFR conditions only.
- No flight in icing conditions
- Do not attempt flight in turbulent conditions or in winds exceeding 22 kts (40 km/h), less if gusty.
- Always follow the appropriate regulations for this category of aircraft.

3 Operation of the Engine

The Rotax 912 is a 4-cylinder, four stroke, horizontally opposed, water-cooled engine.

Never move the prop with the ignition (MAG) switches on!

Fuel type for four-stroke 912 UL engine:
Super leaded or unleaded, AVGAS 100LL

To start the engine:

Main fuel valve	OPEN
Electrical fuel pump	ON
Throttle	IDLE
Choke	OPEN
Carburettor heat	OFF
Ignition (both magnetos)	ON
Propeller area	CLEAR
Brakes	ON
After engine starts, choke	CLOSED

If the engine does not start, repeat the starting procedure.

If the engine has been flooded, close main fuel valve, open the throttle to half and start the engine. When the engine starts, quickly reduce the throttle to idle.

A four-stroke engine requires a fairly long warm up period. Run the engine at 2000 rpm for at least 2 minutes then increase to 2500 rpm until the oil temperature is at least 122°F (50° C).

Perform the mag check at 3850 rpm. Rpm drop should not exceed 300 rpm with a maximum difference between mags of 115 rpm.

4 Flight Operations

4.1 Taxiing:

The nose wheel steering is conventional and is directly connected to the rudder pedals. Push the right pedal to turn right. Push the left pedal to turn left.

Taxiing is simple. The turning radius of the C-42 is small, and the plane handles cross winds during taxing very well.

When taxiing with a strong tail wind, hold the control stick firmly in the neutral or nose-down position.

When taking off or landing on bumpy grass strips, exercise caution to avoid striking the propeller.

4.2 Take-off and climb:

After completing the "before take-off" checklist, make certain the runway and the traffic pattern is clear before you taxi to the take-off positon
Set trim to neutral.
Wing flaps in take-off position (flap position 2).
Gently bring the throttle to full forward position, check tachometer.
At full throttle, the tips of the propeller blades produce hard knocking sounds

Pull the stick slightly back during the initial roll.
The nose wheel will unstick at approx. 27 kts (50 km/h).
Accelerate with the nose wheel 2-4 inches (5-10cm) off the ground.

Aircraft with the Rotax 912 UL S (100 hp) have a greater engine torque which must be countered by a slight right rudder input.
The aircraft will take-off at 38 kts (70km/h). Stick slightly forward and increase airspeed to 54 kts (100 km/h) in shallow climb.
Continue to climb at 54 kts (100 km/h)
Retract flaps at a height of approx. 150 ft. This will cause a slight nose-heavy moment. After reaching the safety altitude the electrical fuel pump can be switched off.
Trim the aircraft for 54 kts (100 km/h) and continue climb. Slight right rudder is necessary to compensate both engine and propeller torque during climb.

Whenever possible, take-off into the wind.

The maximum demonstrated crosswind component for take-off and landing is 16 kts (30 km/h). No special procedures are required. The classical “low-wing” procedure suffices: keep luvward wing low and carry out course corrections using the rudder.

During the intial take-off phase, it is essential that the aircraft accelerate sufficiently in order to prevent stalling should a sudden loss of power be experienced.

By a loss of engine power at altitudes below 260 ft (80 m) do not attempt course corrections of more than 90°. Quickly trim the aircraft for a gliding speed of 49 kts (90 km/h) (push stick forward). Avoid obstructions. Using the flaps touch down at low speed. The approach phase can be shortened by slipping. Before undertaking an emergency landing in rough terrain, turn off the fuel valve and the ignition.

4.3 Cruising flight

In cruising flight the most economical cruise speeds are between 70 and 90 kts (130 - 170 km/h). The power settings required depend upon aircraft load. Max. continous engine speed is 5500 rpm.
In order to fly the aircraft comfortably, it should be trimmed for the desired airspeed with the throttle set for the appropriate rpm for horizontal flight.

Typical cruising flight:

	Rotax 912 UL	**Rotax 912 UL S**
Engine speed	4500 rpm	4500 rpm
Airspeed:	81 kts (150 km/h)	86 kts ((160 km/h)
Fuel flow:	2.20 - 2.64 gph (10 -12 l/h)	2.42 - 2.86 gph (11 - 13 l/h)

The maximum speed of 116 kts (216 km/h) must never be exceeded.
In turbulent air the maximum airspeed is 97 kts (180 km/h).
At the first indication of carburettor icing (rpm drop, rough engine, increase in fuel consuption as indicated by the flow meter, if installed) apply carburettor heat and, if possible, fly the aircraft into non-icing conditions.

4.4 Turning flight

Turns are co-ordinated using the aileron and rudders.
The necessary amount of rudder deflection lessens with increased airspeed.
Banks of 45 degrees or more are not recommended, a banking angle of more than 60 degrees is prohibited. In steep banks keep the nose and airspeed under control by means of the rudders and elevator.

4.5 Stalls

In cruising flight configuration (flap position 1), the stalling speed is 39 kts (75 km/h). The engine cowling will be well above the horizon.
At approximately 43 kts (80 km/h) there will be a slight buffeting of the airframe. When flown in this condition the aircraft is fully controllable. However, lateral attitude corrections must be done mainly with the rudder.
Example: right wing low => rudder deflection to the left.

If the aircraft is stalled slowly with the elevator in detent, it will enter into a stable stalled descent. Altitude loss can be as much as 100 ft.

During a whip stall, the aircraft clearly pitches down (up to 40°). By slightly releasing the elevator, airspeed will increase and the aircraft will return to horizontal flight. Maximum altitude loss is 250 ft.

The aircraft reacts similarly in all flap positions.

Stall speeds for the various flap position,
take-off weight: 1042 lbs (472.5 kg):

v_{s1} flap position 1 (cruising flight)	ca. 40 kts (75 km/h)
v_{s2} flap position 2 (take-off/landing)	ca. 38 kts (70km/h)
v_{s0} flap position 3 (landing)	ca. 35 kts (65 km/h)

The stall speeds above will be affected slightly with variations in take-off weights.

4.6 Descent and landing

Begin with your approach in plenty of time in order to obtain the correct landing configuration without hurrying. Activate carburettor heat.
The electrical fuel pump **must be switched on**.
Reduce airspeed to below V_{FE} (60 kts / 105 km/h) before extending flaps. Optimum speed is approx. 48 kts (90 km/h).
During final approach maintain an airspeed of at least 48 kts (90 km/h) with the throttle at idle.

For short landings, use flap position 3 (landing position). The approach can be further shortened by slipping.

The glide angle in flap position 2 (take-off/landing) is significantly shallower and the flare distance thus much longer.

At approximately 10 ft (3m) begin rounding out to the landing flair. Begin final flair at about 2 ft.(0.6 m). Landing speed is approx. 35 kts (70 km/h).

4.7 Shutting down the engine:

Under normal conditions, the engine will have cooled down sufficiently during descent and taxiing so that it can be shut down by turning off the ignition. Shut off all electrical accessories and radios **before** shutting down the engine.

4.8 Sudden loss of engine power:

I Loss of engine power during take off

Depending upon speed and altitude, lower nose and trim for gliding speed (48 - 54 kts / 90 - 100 km/h). Do not attempt to return to airfield if altitude is below 260 ft (80 m) after gliding speed has been reached. At lower altitudes it is best to land straight ahead without attempting any course corrections.

Before attempting an emergency landing in rough terrain, turn off the fuel valve and switch off the ignition. When landing in high grass, reduce speed immediately overhead by extending the flaps to position 3 (landing), pull stick full aft and allow the aircraft to sink into the grass.

II Loss of engine power during cruising flight

Cross-country flights should be planned to ensure that a suitable landing field can be reached in the case of loss of engine power.

Once gliding speed has been established (flaps position 1 = cruising flight, V_{IAS} = 48 - 54 kts / 90 - 100 km/h), look for a suitable landing field taking wind conditions into consideration. The best glide ratio is approx. 11:1 at 490 ft/min (2.5 m/s).

A lower sink rate can be achieved with flap position 2 (take-off/landing), approx. 46 kts (85 km/h), it does not however result in a better glide angle.

With sufficient altitude you may attempt to restart the engine, check:

1. Fuel valve	OPEN
2 Magneto switches	ON
3. Fuel	SUFFICIENT
4. Fuel pump	ON

III Starting the engine in flight

- both magneto switches	ON
- electrical fuel pump	ON
- throttle	¼ OPEN
- carburettor heat	OFF
- fire up engine using starter	

Maintaining airspeed to windmill the prop can help.

4.9 Emergency procedures

I In slow flight if a wing drops
Reduce back pressure on the stick and lower the nose.
Recover

II Sideslipping
Rudder in the opposite direction to the sideslip
Reduce back pressure on stick

III Spins.
Throttle to idle.
Full rudder opposite to the direction of rotation
Reduce back pressure on stick
Slowly pull aircraft up

IV Spiral dive
Aileron and rudder opposite to the direction of rotation and pull back stick slightly.

V Loss of elevator control
Using the elevator trim flap, the aircraft can be trimmed to speeds between 43 and 92 kts (80 und 170 km/h). In calm weather conditions it can also be used to try to land the aircraft. If in doubt, deploy the parachute rescue system.

VI Loss of aileron control
Use the rudder to create a roll moment due to side-slip.
If in doubt, deploy parachute rescue system.

VII Loss of rudder control
Flat curves can be flown using the aileron.
Eventually (while flying straight ahead) emergency landing.
If in doubt, deploy parachute rescue system .

VIII Carburettor fire

Main fuel valve	OFF
Electrical fuel pump	OFF

Full throttle
Slip the aircraft
Follow emergency landing procedures.

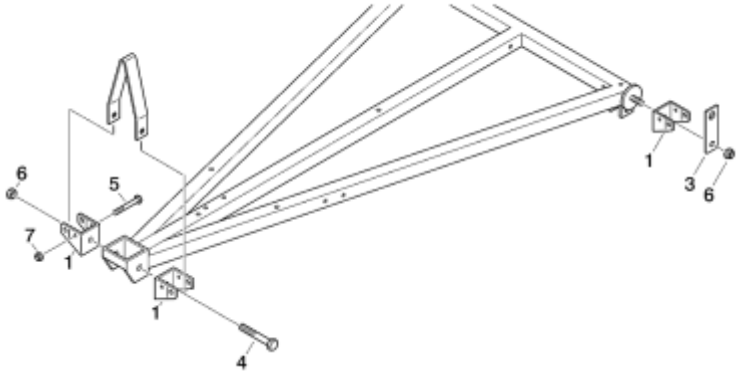
5 Ground Handling

5.1 Towing

Moving the aircraft by hand is accomplished by using the tail struts upper connections as push points. Since there is no tow bar applicable at the nose gear, you have to press down the tail to raise the nose wheel off the ground. With the nose wheel clear of ground, the aircraft can be turned by pivoting it about the main wheels.

5.2 Hoisting

The aircraft may be lifted with a hoist of at least 1000 lb (0.5 tons) capacity by using a ceiling hangers T-support. Using suitable spring snap hooks they can be hooked in at the brackets installed at the aircraft.



5.3 Parking

Parking precautions depend principally on local conditions. As a general precaution, set parking brake or chock the wheels and lock the controls. In severe weather and high wind conditions, tie down the aircraft as outlined in paragraph 5.4 if a hangar is not available.

Caution

Do not set parking brakes during cold weather (when accumulated moisture may freeze the brakes) or when brakes are overheated.

August 2011

5.4 Tie-Down

When parking the aircraft in the open, head into the wind if possible. Set brakes.
After completing the preceding, proceed to moor the aircraft as follows:
Tie ropes to the wing tie-down fittings (upper end of each wing strut).
Secure the opposite ends of ropes to ground anchors.
Secure a tie-down rope (no chains or cables) to the exposed propeller shaft and secure the opposite end of the rope to a ground anchor.
Secure controls to the rearward position by using the seat belts.

Tie Down Points Liftstrut

Tie Down Point Propeller Shaft

6 Minimum equipment

- Four point harness for each seat
- Airspeed indicator 0 - 116 kts (0 - 216 km/h).
- Altimeter w / Kolsmann window
- Compass
- Tachometer
- Cooling liquid temperature gauge
- Oil temperature gauge
- Oil pressure gauge
- Fuel gauge
- Generator charge control
- Data placard
- - Pilot's operating handbook
- - Parachute rescue system
- Checklist

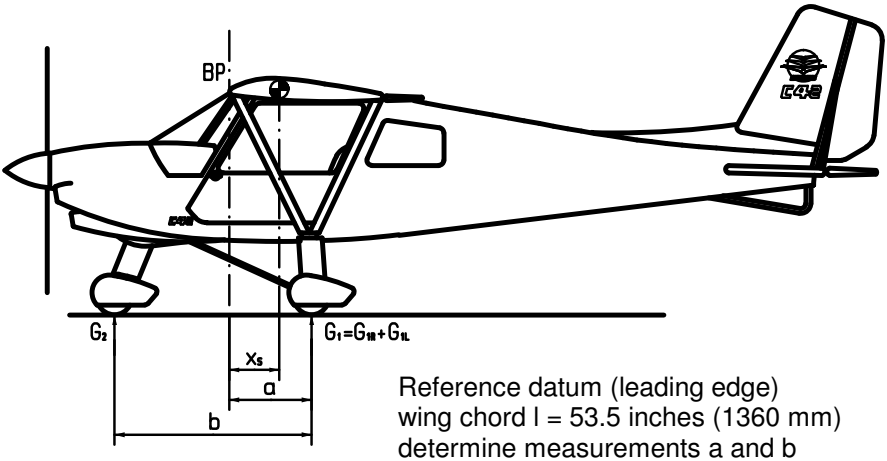
7 Dimensions

Cf. following page.

8 Weight and balance

Place the aircraft in a level position on three scales with the stabilizer and elevator leveled.

The center of gravity is measured in mm or inches behind the reference datum and then calculated as a percentage of the wing chord.



Reference datum (leading edge)
wing chord l = 53.5 inches (1360 mm)
determine measurements a and b
(center of wheel axle).

$$\text{(I)} \quad x_s\,mm = a - \frac{G_2 \cdot b}{G_1 + G_2} = ...mm$$

$$\text{(II)} \quad x_s\,\% = \frac{x_s\,\text{mm} \cdot 100}{1360\,mm} = ...\%\,1$$

Empty weight center of gravity: Serial No.

Basic empty weight (standard equipment): kg
Operating empty weight (incl. optional equipment): kg

Typ: C 42 B - Aircraft data sheet No:

a = mm, b = mm

G_1 G_{1R} : + G_{1L}: = kg
G_2 = kg
G total = kg

x_s mm: mm

$x_{s\,\%}$: % L

It is the pilot's responsibility to ensure that the MTOW of 1041 lbs (472.5 kg) is not exceeded.

max. useful load: kg
MTOW: 472,5 kg

Date: .....

Signature: .....

Loading plan

position	weight x lever arm = torque		
	kp	cm	cm kp
empty weight			
1. seats		40	
2. fuel		95	
3. baggage		130	
total weight kp		total torque	kp

center of gravity CG = $\frac{\text{total torque [cm kp]}}{\text{total weight [kp]}}$ = cm

allowed range for CG: 300 - 560 mm behind zero datum (leading edge)
empty weight CG: 280 - 460 mm behind zero datum (leading edge)

Loading plan

position	weight x lever arm = torque		
	kp	cm	cm kp
empty weight			
1. seats		40	
2. fuel		95	
3. baggage		130	
total weight kp		total torque	kp
center of gravity CG =	total torque [cm kp] / total weight [kp] =		cm

allowed range for CG: 300 - 560 mm behind zero datum (leading edge)
empty weight CG: 280 - 460 mm behind zero datum (leading edge)

Loading plan

position	weight x lever arm = torque		
	kp	cm	cm kp
empty weight			
1. seats		40	
2. fuel		95	
3. baggage		130	
total weight kp		total torque	kp
center of gravity CG =	total torque [cm kp] / total weight [kp] =		cm

allowed range for CG: 300 - 560 mm behind zero datum (leading edge)
empty weight CG: 280 - 460 mm behind zero datum (leading edge)

9 Data placard and checklist:

Airspeeds		
Stall speed		35 kts (65 km/h)
Never-exceed speed		116 ks (216 km/h)
Load factor		
Positive limit load factor		+4 g.
Negative limit load factor		-2 g.
Maximum recommended wind speeds for operation		
Steady winds		22 kts (40 km/h)
Demonstrated cross-wind component		16 kts (30 km/h)
Capacity	max	cf. page 17
	min	65 kg

The pilot operates this aircraft at his own risk.

Manufacturer _____

Serial no. _____

Registration
LTZ-Nr _____

Year of manuf _____

Month _____

Aircraft basic
empty weight _____

10 "Before take-off" checklist

1.	Harnesses buckled correctly?	
2.	Control system free and correct?	
3.	Parachute system armed?	
4.	Check fuel level	
5.	Aux. fuel pump	ON
6.	Choke	OPEN
7.	Carburettor heat	OFF
8.	Electrical equipment	ON
9.	Altimeter set?	
10.	Wing flaps	flap position 2
11.	Check magnetos	
12.	Wind direction?	
13.	Runway and approach	CLEAR

11 Equipment

Engine: Rotax 912 UL
C-gearbox, 2.27 to 1 reduction ratio

Approved propellers

- WARP DRIVE 2-blade, 68" diameter
- WARP DRIVE 3-blade, 68" diameter
- Sport-Prop 170R 3-blade
- GSC 3-blade propeller, 68" diameter
- Neuform 2-blade CR2-75 ground adjustable propeller
- Neuform 3 blade CR3-75 ground adjustable propeller
- Kiev Prop 3-blade BB 263/1700 ground adjustable propeller
- Helix 3-blade H50F-1,75m-R-SI-12-3 ground adjustable propeller

Motor: Rotax 912 UL S
C-gearbox, 2.43 to 1 reduction ratio

Approved propellers

- WARP DRIVE 3-blade, 68" diameter
- GSC 3-blade propeller, 68" diameter
- Neuform 3-blade CR3-75 ground-adjustable prop.
- Neuform 3-blade CR3-V-R2H in-flight-adjustable prop.
- Kiev Prop 3-blade BB 283/1800 ground-adjustable prop.
- Helix 3-blade H50F-1,75m-R-S-14-3 ground-adjustable prop

Approved parachute rescue systems:

BRS 5-UL4
BRS-6-1050-SP-DAeC
Magnum 450 Speed (MTOW 450 kg only)
Magnum High speed Soft pack
Magnum Lightspeed Soft pack

Be certain to follow the instructions of manufacturer for installation, required maintenance and particularly the avoidance of moisture in the parachute pack. Should the chute get wet, it must be aired and repacked.

There is a time limit on the use of the rocket cartridge in rocket deployed systems.
Before taking off, remove the system safety pin.
After landing secure the system with the safety pin.

Fuel tank capacity - approved versions:

1 x or 2 x 11 imp. gallons (50 l)
1 x or 2 x 14.3 imp. gallons (65 l)

Aluminium wings
Electrical flap drive

12 Flight performance:

12.1 Take-off distance

	Rotax 912 UL	Rotax 912 UL S
Sea-level, +15°C, no wind		
Take-off roll (gross) (1041 lbs/472.5 kg)	345 ft (105 m)	310 ft (95 m)
Take-off distance over 50 ft (15 m) obstacle		
solo	700 ft (210 m)	605 ft (185 m)
gross	800 ft (245 m)	705 ft (215 m)
Take-off speed	38 kts (70 km/h)	38 kts (70 km/h)
Speed at 50 ft (15 m) obstacle	49 kts (90 km/h)	49 kts (90 km/h)

Higher elevations and higher temperatures lengthen the take-off distances.

The figures given are valid for a MTOW of 793 lbs (360 kg) flown solo and 1041 lbs (472.5 kgs) with two persons on board. No wind, on dry, even ground with short grass.

12.2 Climb performance

Sea-level, +15°C, no wind			
Engine speed		5500 rpm	5200 rpm
Rate of climb	solo	1180 ft/min (6.0 m/s)	1377 ft/min (7,0 m/s)
	gross	944 ft/min (4.8 m/s)	1082 ft/min (5.5 m/s)
Speed for best rate of climb		49 kts (90 km/h)	49 kts (90 km/h)

May 2010

12.3 Cruise performance (solo)

at engine speed 4700 rpm (65%)	86 kts (160 km/h)	92 kts (170 km/h)
Cruise speed for best range	76 kts (140 km/h)	78 kts (145 km/h)
Maximum range with 14.3 imp. fuel gallons (65 l)and no wind	ca.350 nm (650 km)	ca 350 nm (650 km)

12.4Engine off performance

MTOW 1041 lbs (472.5 kg)

Minimum sink rate 393 ft/min (2 m/s)
at 46 kts (85 km/h), flap position 2 (take-off/landing)

Best glide angle 1 to 11
at 51 kts (95 km/h) flap position 1 (cruise)

ATTENTION ! : Follow the instructions in the Rotax 912 operator's manual.

13 Attaching the wings

13.1 to the folding mechanism

As an option , the IKARUS C42B is also available with a folding wing thus reducing the amount of hangar space required. For road transport, the wings must, however, be removed completely.

The wings are attached to the folding mechanism as follows:

1. Remove the stop ring from the slide tube.

2. Place the wing parallel to the fuselage with the rear wing tip on the ground.

3. Lift the wing and slide the attachment block 2.5 inches (5cm) over the slide tube.

4. Attach the stop cable to the latch in the middle of the slide tube. Re-attach the stop ring to the end of the slide tube.

If both wings are in the folded back position, your C-42 can be easily moved by one person into the smallest of spaces in the hangar.

13.2 Attaching the wings to the fuselage

The wings are attached to the fuselage as follows:

Step 1 Bring the wing main strut into correct position to the wing and attach the auxiliary struts at front and rear spar.

Step 2 Grip the main strut and raise the wing tip. Keeping the wing in a vertical position, carry the wing forward at 90° to the fuselage.

Step 3 Turn the wing into a horizontal position, keeping the wing tip slightly higher than the wing root.

Step 4 Slowly insert the wing into position with the wing spars into the channels.

Step 5 Before inserting into the spar channels, make sure that the rear spar is properly positioned on the guide line so that it can be properly locked. The right wing needs to be rotated clockwise to orient the locking pin properly (the left wing must be rotated anti-clockwise).

By moving slightly upwards, the rear wing spar will lock into the locking pin and the forward spar is automatically in the correct position below the locking pin in the forward wing tube.

Push the forward wing spar into the attachment while slightly lowering the wing tip. The forward wing spar will lock into the locking pin. Insert the lower end of the wing strutt into the square frame. Check that both wing spars have locked properly into place.

Step 6 Attention and now immediately

1 insert front wing bolt and safety pin

2 insert rear wing bolt and safety pin

3 insert strut bolt through square frame and struts block

4 all three bolts must have **the safety pins**.

5 lift the wing at the wing tip and check the attachment of the wing strut block to the square frame.

Repeat Step 1 to 6 for the other wing.
Remove any control locks used.

Step 7 attach right and left aileron push rods to the see-saw connection. Carefully assure that the slide mechanism of the special link connectors are in completely locked position.

Step 8 left and right landing flaps must be locked.

Step 9 position and fasten wing center section fairing.

13.3 Folding the wings for hangaring

1. Remove wing center section fairing

2. Unlock aileron push rods from see-saw cross connection

3. Unlock landing flaps

4. first: unlock strut block from lower square frame by removing strut bolt
   second: unlock rear wing spar by removing wing bolt
   third: unlock front wing spar by removing wing bolt

The following 5 steps must be undertaken to fold back the wings

Step 1 Lift right wing at the wing tip, rotate slightly to unlock firest the forward wing spar and then the rear one.

Step 2 Draw the wing back off the fuselage until the stop ring on the slide tube is reached.

Step 3 Turn the wing into a vertical position - underside of the wing forward.

Step 4 Swing wing tip back.

Step 5 Place wing tip on to the retainer bracket on the empennage.

Repeat steps 1 to 5 for the left wing.

14 Pre-flight inspection

Before each flight the pilot must carry out a visual inspection of the aircraft.

1. Engine

- Check propeller and spinner for damage and security
- Check cowling near the propeller for abrasion (sign of defective engine suspension or improper cowling attachment)
- Check for leakage under the engine cowling
- Check cooling liquids and lubricants
- Check engine cowling for security
- Check that coolers are clean (oil cooler, water cooler)
- Check air vents for blockage
- NACA-intake free

2. Landing gear

- Check secure attachment of all components (hub caps, brake cylinders, brake discs)
- Check for deformation
- Check air pressure in gas-spring damper (aircraft level, pull aircraft down and release, gas-spring damper must return to the fully extended position)
- Check pressure and condition of tyres

3. Left wing

- Wing spar connections secure?
- Wing struts properly attached and secure?
- Auxiliary struts secured with quick-release fasteners?
- Pitot tube secure and free from blockage and water?
- Check aileron shift levers and push rods by opening the zips on the underside of the wings

- Check condition of fabric covering (tears, etc.)
- Check profiled struts for secure attachment
- Check wing tips and wing tube for deformation
- Check attachment of ailerons and flaps.

4. Left side of fuselage

- Check condition of glass-fibre fairing (cracks, holes, etc.)
- Check secure attachment of glass-fibre fairing (check for missing screws at the upper/underside connection)
- Check elevator shift lever through the inspection hole in the fuselage wall (baggage compartment)
- Tank filler cap secure?

5. Empennage

- Check attachment of horizontal stabiliser
- Check control surface hinges?
- Check elevator inter-connection
- Trim flap secure?
- Check elevator push rod connections
- Horizontal tail struts secure - deformation?
- Rudder cables secure?
- Check fabric covering (tears, abrasion)

6. Right side of fuselage

- Check condition of glass-fibre fairing (cracks, holes, etc.)
- Check secure attachment of glass-fibre fairing (missing screws, etc.)

7. Right wing

- cf. left wing

8. Cabin, inside and outside

-Check condition of windscreen, doors including locking mechanism (cracks)
- Check freedom of movement of controls (stick, pedals, flap lever, flap lever detent)
- Check brake lever and detent
- Aileron shift lever secure?
- Visually check aileron cables and pulleys
- Check fuel valve

9. Instruments

- Power supply (ignition switch in position 1)
- Altimeter reading
- Amount of fuel
- Radio and intercom in working order?

10. Drainage

- Drainage of the fuel tanks (the drainage tap is located under the copilots seat)

15 Care and maintenance

1. Care and cleaning

All metal parts are corrosion-resistant and require no special care. Dirt on the aircraft and the fabric can be removed by using clear water.

Repair of the wing fabric. Fix the smallest rips for your safety.

A wing fabric repair kit is available from the manufacturer. Attach the patch on clean, grease-free area using contact cement.Larger rips in the fabric or along the seams must be repaired by covering experts. When in doubt, contact the manufacturer.

Exercise due care in the maintenance and cleaning of the cabin glazing! We recommend the opulent use of clear water and sparse rinsing agent for moistening and washing away staining. For drying, a fine microfibre cloth should be used which is solely used for this purpose. By no means solvent-containing or acetic acid-containing cleaning agents may be used.

2. All maintenance

work must be carried out by appropriately qualified persons.

For Austria only:

The relevant regulations with respect to maintenance work (ZLLV 1995 - BGBlNr. 191) in their current versions must be upheld at all times.

3. Especially Repair work and major changes must be reported and officially inspected.

4. Airworthiness inspections in Germany must be carried out by the manufacturer or by DAeC inspectors. In Austria, inspectors are named by Austro Control.

5. Repair work

Repairs by the owner are limited to the exchange of defect parts.

Only approved spare parts may be used.

Damaged parts may never be repaired and re-installed.

6. Periodical inspections

Periodical inspections (25 / 50 / 100 hour inspection) should be carried out. Cf. inspection list for details of the C42 COMCO IKARUS maintenance manual and the ROTAX 912 maintenancemanual. If not conducted, the safety of the aircraft is not guaranteed and warranty claims may be cancelled.The periodical inspections should be conducted in one of our IFC (Ikarus Flight Center), ITB (Ikarus Technical Base), ISC (Ikarus Service Center).If periodical inspections should be conducted by the owner himself, these technical documents have to be ordered at IFC/ITB/ISC or directly at COMCO IKARUS GmbH in Hohentengen.

7. Technical problems

Technical problems or defects should be reported to
- the manufacturer
- the relevant national authority

16 Rigging data

Wing span
30.84 ft (9.40 m) Wing area 140.4 ft^2 (13.05 m^2)

Wing chord at root
4.79 ft (1.435 m) Wing dihedral 1°

a) Incidence angle of wing relative to fuselage main tube: 8,5°

Note The wing angle is the angle between the lower edge of the rear wing tube and the lower edge of the forward wing tube at the root rib.

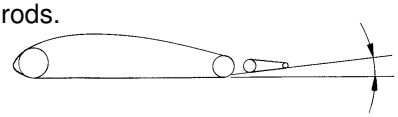
b.) Incidence angle of stabiliser relative to the fuselage main tube: 7°

Note The stabiliser incidence angle is the angle between the lower edge of the forward tube and the lower edge of the rear stabiliser tube.

Incidence angle difference between wing and stabiliser
at the root rib: **1,5°**

c.) Control surface deflections

Note: The angle of the aileron underside relative to the wing chord is -7° (tangent forward to rear spar). It is defined by the length of the aileron push rods.



Distance from axis of rotation:

Aileron			
neutral p.	-7°±-1°	1.38" + 0.39" (35 mm ± 10 mm)	9.84" (250 mm)
Up	20°±-2°	3.54" + 0.39" (90 mm ± 10 mm)	9.84" (250 mm)
Down	14°±-2°	2.76" + 0.39" (70 mm ± 10 mm)	9.84" (250 mm)
Rudder			
Left	32°±-2°	8.86" ± 0.39" (210 mm ± 10 mm)	16.24" (410 mm)
Right	32°±-2°	8.86 " ± 0.39" (210 mm ± 10 mm)	16.24" (410 mm)
Elevator			
Up	28°±-2°	8.27" ± 0.59" (210 mm ± 15 mm)	16.24" (410 mm)
down	20°±-2°	5.12" ± 0.59" (130 mm ± 15 mm)	16.24" (410 mm)

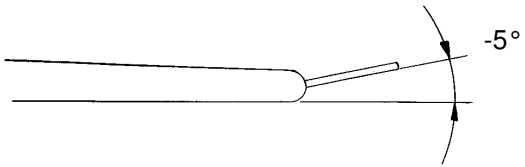
Flaps

Note: Flap angle is measured at the flap underside relative to the underside of the wing at the root area (tangent forward to rear spar)

Position 1 (cruise)	-5°±-1°	1.06" ± 0.39" (27 mm ± 10 mm)	12.20" (310 mm)
Position 2 (take-off/landing)	+11°±-1°	2.36" ± 0.39" (60 mm ± 10 mm)	12.20" (310 mm)
Position 3 (landing)	+32°±-1°	6.69" ± 0.39" (170 mm ±10 mm)	12.20" (310 mm)

Trim flap

Lever nose-down Trim flap relative to rudder surface -5°



d) Landing gear

Main landing gear	2.0 - 2.5 bar	29 - 36 psi
Nose landing gear	1.6 - 2.0 bar	23 - 29 psi
Shock absorbers	28.0 - 34.0 bar	400 - 490 psi
Amount of oil	0.42 pts (200 ml)	
Hydraulic oil	HVP 10	

e) Brakes

Always use low viscosity mineral oil
"CASTROL LHM 1756"
or
"PENTOSIN LHM" (Citroen)

Never use Glykol-based brake fluid!!

f) Powerplant

Torque moment for propeller attachment screws	25 Nm
Torque moment for propeller blade setting screws	12 - 15 Nm

17 Information for ultralights with towing gear

I. Glider towing

17.1 Necessary equipment for towing aircraft

If the following additional equipment is installed the ultralight aircraft may be used to tow gliders:

1. Powerplant Rotax 912 UL S (74 kW / 100 hp)
   Warp Drive 3-blade 68" diameter
   Neuform 3-blade CR3-75 ground-adjustable
   Neuform 3-blade CR3-V-R2H in-flight-adjustable
   Kiev Prop 3-blade BB 283/1800 ground-adjustable

2. Tow hook mount

3. Tow hook

4. Comco release mechanism operated by the pilot

5. Rear mirror / camera system

6. Engine monitoring instruments with appropriate markings

7. Placards at the airspeed indicator and tow hook

Installation must follow the relevant instructions from the manufacturer. Unauthorised alteration of the towing equipment is prohibited.

Towing cable and weak link:

Only cables which fulfill aviation, DIN or factory standards may be used if these standards (specifications) are detailed enough and long-term delivery quality is assured. The cable connection must be protected against wear and tear by an appropriate cover.

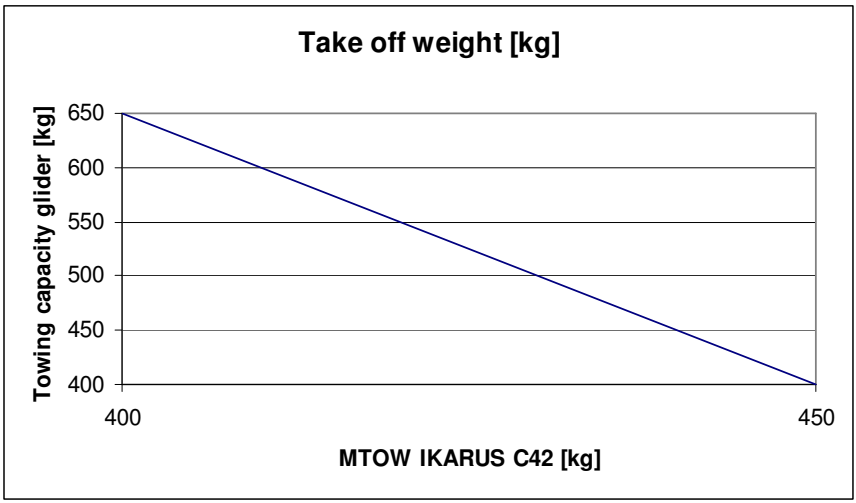
When using a towing cable without a weak link the true ultimate load of the towing cable must not exceed 300 daN. In the case of cables with a higher ultimate load, a weak link must be integrated to protect the ultralight aircraft and the glider.

Length of towing cable:	131 - 197 ft (40 - 60 m)
Max. nominal ultimate strength at weak link:	660 lbs (300 daN)

Joining ring pair on towing cable according to LN 65091

17.2 Operating limitations

a) Permissible take-off weights
The ultralight aircraft IKARUS C 42 B is certified for glider towing with a maximum take-off weight of 1433 lbs (650 kg).
The maximum take-off weight of the towing ultralight is 882 lbs (400 kg).
The maximum take-off weight of 1041 lbs (472.5 kg) of the towing ultralight may only then be used to the full if the weight of the glider does not exceed 882 lbs (400 kg).



b) Towing speeds

The minimum speed of the tug/glider combination depends upon the type of glider being towed. It, however, must not be lower than the minimum towing speed for the IKARUS C 42

Vmin tow = 49 kts (90 km/h)

Depending upon the take-off weight of the IKARUS C 42 the following flap positions should be used at towing speeds below 53 kts (97.5 km/h):

Take-off weight below 882 lbs (400 kg)
Flap position 1
Take-off weight between 882 lbs (400 kg) and 1041 lbs (472.5 kg)
Flap position 2

The minimum speed of the majority of modern gliders generally lies above that of the ultralight towing aircraft. This means that the minimum speed of the combination depends upon the operating limitations of the glider. In consultation with the glider pilot, particular attention must be paid to the minimum speed during the entire towing procedure.

Maximum towing speed with the flaps in position 1 is 81 kts (150 km/h).
In order to achieve optimum performance during take-off and the towing of slow flying gliders, towing with flaps in flap position 2 is permitted.

IMPORTANT! Before towing, the pilot of the towing aircraft and the pilot of the glider must agree on the towing speed.

17.3 Flight characteristics and performance

a. Flight performance

Glider take-off weight	860 lbs (390 kg)
Runway conditions	dry grass
Temperature	15°C
Elevation	0 ft ASL

Take-off weight of glider (lbs) Type of glider	Take-off distance, 50 ft obstacle [ft]	Towing speed [kts] IAS	Rate of climb [ft/min]
683 lbs Standardlibelle	1313	57	689
816 lbs LS4	1477	59	591
860 lbs Kestrel	1575	59	591
1300 lbs ASK 21	1706	57	453
1433 lbs Duo-Discus	1903	57	374

b. External factors

- Increase take-off distance by 5% for every 10°C increase in ambient air temperature
- Increase take-off distance by 10% for every 1000 ft increase in pressure altitude
- Decrease take-off distance by 10% when taking off from a paved runway

A wet grass runway can considerably increase the take-off distance

- Dirt on the glider surface, particularly on the wing leading edge, and raindrops can increase recommended towing speeds and take-off distances, depending upon the type of glider. Appropriate instructions from the glider manufacturer should be followed. Rain or dirt particles have no significant influence on the performance of the IKARUS C 42 when towing.
- Headwinds will reduce the take-off distance as follows:

  10 kt take-off distance with no wind x 0.7

  20 kt take-off distance with no wind x 0.65

  30 kt take-off distance with no wind x 0.6

c.Instructions for towing operations

- Electrical fuel pump must be switched on while towing
- Test the tow hook before each tow
- Check the towing cable and the weak link for mechanical damage before each tow

17.4 Placards

- Next to the airspeed indicator
  Observe towing speed

- On the release lever
  Tow hook - pull - open

- On the tow hook mount
  Weak link - max. 660 lbs (300 daN)

17.5 Emergency procedures during towing

a) During take-off
Should one of the following situations arise, the towing cable should be released by the towing pilot:

- if the glider breaks out and the glider pilot does not react.
- if the glider climbs above the towing aircraft and the attitude of the towing aircraft is no longer properly controllable
- if the towing aircraft climbs prematurely and the towed glider cannot follow due to a lack of speed (high surface loading, water ballast, etc.), the rate of climb of the towing aircraft should be reduced and the towing speed increased immediately. If this is not possible, the towing cable should be released.

NOTE: If possible, the pilot of the towing aircraft should inform the glider pilot before releasing the towing cable.

b) During towing
- Lateral displacement of less than 30°, vertical displacement of less than 30° (high) and 20° (low) can be corrected using the rudder and elevator. In the case of greater displacement angles, particularly high vertical displacement angles, the towing cable should be released by the towing pilot.
- Avoid circling with a long towing cable. When circling, make sure that the turn radius is sufficiently large so that the glider can follow the towing aircraft.

- If there is a danger of exceeding the maximum engine temperatures (oil and cylinder head temperature), reduce engine rpm and increase the towing speed.

c) Failure of the release mechanism

- If the release mechanism of the towing aircraft fails, execute final approach over an obstacle-free area and land with tow hook released.
- If both release mechanisms fail, execute descent but do not exceed the maximum rate of descent of 295.3 ft/min (1.5 m/s) and land with the tow hook released (by employing the brake flaps of the glider, make sure that towing cable is tense).

18 Inspection and maintenance intervals

NOTE:
The inspection and maintenance instructions in the operating handbook for the E 85 tow hook must be followed at all times.

The maximum operating time of the tow hook between two general overhauls is:
2,000 take-offs or 10,000 releases.

The weak link must be replaced every 200 tows.

In addition to the inspection and maintenance instructions in the operating handbook for the E 85 tow hook, the following should also be considered:

Check Bowden cable for freedom of movement and damage near the release lever and near the tow hook	before each towing flight
Check release force at release lever with unloaded tow hook ≤ 13 daN	every 200 tows
Clean and grease the bowden cable at the adjustment openings near the release lever and the tow hook	every 200 tows

II. Banner tow

1. Equipment in the tow plane

In order to perform a banner tow, the aircraft must be equipped with the same equipment as described above for sailplane towing.
The following propellers are approved for banner towing when the aircraft is powered by a ROTAX 912 UL (80 PS):

Warp Drive, 3 bladed, 68"
Neuform CR3-75, 3 bladed, ground adjustable propeller
Kiev Prop BB 263/1700, 3 bladed, ground adjustable propeller

Banners may only be picked up and towed according to approved procedures and by aircraft with the appropriate equipment.
Banners must be made of water-repellent material.
Only banners may be used which fulfil the design requirements defined by the organisations DAeC and DULV.

2. Limitations

a) Maximum permissible banner drag: 80 daN

b) No. of occupants: 1 pilot or 2 pilots during tow training

Warning: Do not exceed maximum take-off mass!

c) Weak link rating, tow rope
Banner tow 100 daN

d) Length of tow rope
Laid-out banner 40 – 60 m
Rolled banner 25 – 40 m

e) Speeds
Minimum airspeed 85 km/h
Best rate of climb airspeed 95 km/h
Airspeed during tow 100 km/h
Maximum airspeed 120 km/h
Flaps must be retracted at airspeeds above 105 km/h!

f) Banner size

Rotax 912 UL (80 PS)	120 m^2
Rotax 912 ULS (100 PS)	150 m^2
Maximum banner height	5 m
Maximum banner mass	20 kg

3. Placards

a) In full view of the pilot on the instrument panel:

Aero-towing:
Operating conditions for banner tow are to be found in the supplement to the Pilot's Operating Handbook.

b) On the airspeed indicator:

Watch airspeed during tow

c) On the release lever:

Aero-tow coupling - pull - open

4. Emergency procedures

Banner tow

- In the case of an emergency (e.g. engine loss, loss of power) the banner should be dropped over open country, if possible.

- If the banner cannot be dropped, the aircraft must be landed with the banner attached, paying close attention to obstacle clearance.

5. Normal procedures

a) The banner must be assembled and used in accordance with the relevant instructions from the manufacturer.

Set flaps to position 2 (take-off/landing) for take-off. Fly low bank turns only.

Avoid aero-towing in rain.

b) Check the following before commencing aero-tow:

- Tow coupling, release mechanism (functionality), rear mirror/camera position

- Condition of tow rope and attachment elements (knots, connecting rings)

- Check banner for damage and completeness

c) The laying out and picking up of the banner must comply with manufacturer recommendations.

d) Except in the case of an emergency, the banner must be dropped at safe airspeed and low altitude within the airfield area over open country with no risk to person or property.
After dropping the banner, the C42 will accelerate slightly.
A landing with the banner attached is only permitted in an emergency.

6. Performance

The take-off distance to clear the 50 ft obstacle increases by approximately 50 %.The ground roll for a laid-out banner set up in accordance with the relevant manufacturer recommendations is not affected. For a take-off with a rolled banner, the relevant distances may be extracted from the following tables:

Rotax 912 S (100 PS) banner size	Ground roll aircraft	Ground roll banner	Take-off distance to clear 50 ft obstacle
70 m^2	110 m	180 m	330 m
120 m^2	150 m	210 m	380 m
150 m^2	180 m	240 m	410 m

Rotax 912 S (80 PS) banner size	Ground roll aircraft	Ground roll banner	Take-off distance to clear 50 ft obstacle
70 m^2	140 m	180 m	360 m
120 m^2	180 m	210 m	410 m

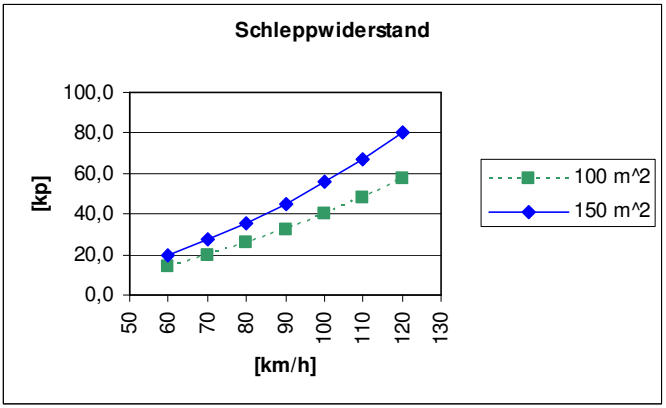
Rotax 912 S (100 PS) banner size	Rate of climb single-seat occupation
70 m^2	3.5 m/s
120 m^2	3.0 m/s
150 m^2	2.5 m/s

Rotax 912 S (80 PS) banner size	Rate of climb single-seat occupation
70 m^2	2.5 m/s
120 m^2	2.0 m/s

Sufficient power should be set for climb as the banner reduces airspeed considerably. The operating limits of the power plant may not be exceeded. The relevant values should be constantly monitored.

Fuel consumption increases by approximately 30%.

Fuel consumption at 100 km/h:
Banner size: 100 m^2 approx. 15 l/h
Banner size: 150 m^2 approx. 17 l/h



19 Special features of aircraft equipped for handicapped pilots

1. Equipment

If the following additional equipment is installed in the aircraft, it can be operated without using the feet to control the nose wheel and the rudder:

1. modified throttle shaft including throttle lever extension;
2. rudder control lever with push rod;
3. placard on rudder control lever.

Installation must be undertaken in accordance with the instructions of the manufacturer. The unauthorised alteration of the equipment for handicapped pilots is not permitted.

2. Installation / Removal

The rudder control lever is attached to the axle in the fuselage and screwed in place using a hexagonal M8xM40 screw.
The push rod which is attached to the rudder control lever is connected to the right pedal of the left seat by a quick-release fastener. The sliding sleeve of the quick-release fastener is then checked for proper fit in the locked position.
Throttle lever length is then set so that the knob is approximately ten to thirty millimetres under the rudder control lever and has free movement under the latter.

The equipment is removed in reversed order.

3. Operation

The nose wheel and the rudder are activated via the rudder control lever which is operated by the left hand. By pulling out the lever, the aircraft is turned to the left, by pushing it in, the aircraft turns to the right.
The right hand remains constantly on the control stick and operates the elevator, aileron and brakes. The left hand operates the rudder control lever and the throttle which is located directly below the rudder control lever.

Take-off:

1. Line up the aircraft on the runway, left hand (LH) on rudder control lever.
2. Apply throttle expeditiously with LH.
3. LH immediately back to the rudder control lever and steer aircraft during take-off run.
4. After take-off in approximately 5 to 10 m above the runway, use LH to check that the throttle is still in the full throttle position.
5. Excepting power changes, LH remains constantly on the rudder control lever.

The various flight conditions, e.g. horizontal flight, turn, slow flight, side-slip, are not affected.

Landing:

Approach procedures are normal. In the case of side-wind, we recommend a wing-down approach.

Attention should be paid to the following when flaring out:

1. Air speed approx. 100 km/h until flare out in approx. 4 to 5 m above the runway, LH on the rudder control lever.
2. Throttle to idle using LH.
3. LH immediately back to rudder control lever and steer aircraft during landing roll.

When carrying out circuits (touch-and-go), follow the procedures for take-off.

20 Flying the IKARUS C42 Series with doors removed

Under the following conditions, the micro-light aircraft IKARUS C42A/C42B may be flown with the doors removed:

- All loose objects (charts, documents) are properly secured.
- Objects may under no circumstances be dropped out of the aircraft during flight.
- Maximum speed for flights with one or both doors removed is 150 km/h IAS.
- Side-slipping is not permitted with doors removed.
- Turbulence in the cockpit will increase when the flaps are set to position III.

21 Additional instructions for dropping parachutists from the IKARUS C42 Series

1. Personnel pre-requisites

In order to use the micro-light aircraft C42A/C42B to drop parachutists, the following pre-requisites must be fulfilled:

- The pilot must have a valid licence and flight experience of at least 100 hours as well as an aeronautical radio licence.

- The parachutist must have a valid licence and have carried out at least 100 jumps with manual release and at least 12 jumps in the last 12 months.

2. Technical pre-requisites

The C42A/C42B micro-light aircraft may be used for dropping parachutists if the following technical pre-requisites are fulfilled:

- The doors, or at least the right door, must be removed before take-off. (It is not permitted to open the door during flight.) The additional instructions for flying the micro-light aircraft C42A/C42B with doors removed must be followed!

- During flight the parachutist must fasten at least the waist seat belt.

- The pilot and the parachutist must be able to communicate with each other at all times.

3. Measures prior to take-off

The pilot and parachutist must agree on the following points before take-off:

- drop zone
- drop altitude
- drop airspeed
- agreed signals
- function and activation of aircraft's ballistic recovery system

Prior to take-off, the course of action for jumping out of the aircraft must be demonstrated and practised on the ground:

- opening the waist seat belt;
- the parachutist turning outward about 90° and possibly holding on to the top of the door frame;
- changing his grip to the lower cockpit frame and the wing strut;
- leaving the aircraft to the side and in front of the wing strut.
- ensuring that there is sufficient distance between the parachutist and the propeller!

4. Drop procedures

After completing the climb to the agreed drop altitude, level off the aircraft and continue horizontal flight at an airspeed of 90 to 110 km/h. Set the flaps to position II (take-off) to this end.

The parachutist opens his waist seat belt, takes up his jump position and signals to the pilot that he is ready to jump.

During the drop, the pilot must compensate any balance changes (slight climb tendency). Once the drop has been completed, the pilot should check that no objects have been caught up in the aircraft (on the wing strut, empennage) which could adversely affect the control surfaces.

The seat belt/safety harness on the co-pilot seat must be secured.

During descent, airspeed limitations must be observed. A debriefing is practical and useful for the future.

January 2011

22 Comco Ikarus Warranty

Warranty Information
Comco Ikarus guarantees to you, the original purchaser, the microlight aircraft which you have purchased from an authorised Ikarus Flight Center, to be in conformance with the applicable Comco Ikarus specifications current at the time of manufacture for a term of two (2) years from the date of purchase of the aircraft. (Warranty Term)

This is the complete and exclusive warranty for a microlight aircraft and in lieu of all other warranties, terms and conditions, whether express or implied.

In no event shall Comco Ikarus be liable for damages nor loss in excess of the purchase price nor for any incidental special or consequential damages, including without limitation loss of use, loss of time, inconvenience, commercial loss, lost profits or savings arising out of the use or inability to use the aircraft, to the full extent such may be disclaimed by law.

This Warranty does not affect any statutory rights that you may have if you are a consumer, such as a warranty of satisfactory quality and fit for the purpose for which products of the same type are normally used under normal use and service, nor any rights against the seller of the aircraft arising from your purchase and sales contract.

How to get Warranty Service

Should the microlight aircraft not comply with the warranted specifications, the warranty claim consists of a repair of the defect by Comco Ikarus at no charge.

You must inform Comco Ikarus of the lack of conformity to the applicable specifications of the microlight aircraft promptly if you detect a defect in material, workmanship or lack of conformity and in any event within a term not to exceed the Warranty Term, and must immediately submit the aircraft for service to an authorised Ikarus Flight Center, Ikarus Technical Basis or a Ikarus Service Center.

Comco Ikarus shall not be bound by product related statements not directly made by Comco Ikarus nor any warranty obligations applicable to the seller.

In most cases the authorized Ikarus Flight Center which sold and/or installed your aircraft and original accessories will honour a warranty claim and/or provide warranty service.

Claiming

In order to claim the warranty service you must return the microlight aircraft and/or accessory in question to an authorised Ikarus Flight Center or Ikarus Service Center in the original configuration as supplied by Comco Ikarus.

The microlight aircraft should be accompanied with the following information

- Name of the owner
- Address of the owner
- Telephone numer of the owners
- Email address of the owner
- Comco Ikarus works number
- Total flying hours
- Number of landings
- Description oft he problem
- Digital photos if requested

In order to be eligible to receive warranty service, you must present your receipt of purchase or a comparable substitute proof of purchase bearing the date of purchase.

You must ensure that all and any repairs or servicing is handled at all times by an authorized Ikarus Flight Center or Ikarus Service Center in accordance with Comco Ikarus service requirements.

In some cases, you may be requested to provide additional information concerning the maintenance of the aircraft by Ikarus Flight Centers or Ikarus Service Centers only, therefore it is important to keep a record of any previous repairs, and make them available if questions arise concerning maintenance.

Conditions

This warranty will not apply if the type or works number on the aircraft has been altered, deleted, duplicated, removed or made illegible. Comco Ikarus reserves the right to refuse free-of-charge warranty service if the requested documentation cannot be presented or if the information is incomplete, illegible or incompatible with the factory records.

Repair, at Comco Ikarus option, may include the replacement of parts or accessories with functionally equivalent, reconditioned or new parts. Replaced parts or accessories are warranted for the balance of the original warranty time period. The Warranty Term will not be extended. All original parts and accessories that have been replaced shall become the property of Comco Ikarus. Comco Ikarus does not warrant the installation, maintenance or service of the products, parts and accessories.

Comco Ikarus will not be responsible in any way for problems or damage caused by any ancillary equipment not furnished by Comco Ikarus which is attached to or used in connection with the aircraft, or for operation of Comco Ikarus equipment with any ancillary equipment and all such equipment is expressly excluded from this warranty.

When the aircraft is used in conjunction with ancillary equipment not supplied by Comco Ikarus, Comco Ikarus does not warrant the operation of the product combination and Comco Ikarus will not honour any warranty claim where the aircraft is used in such a combination and it is determined by Comco Ikarus that there is no fault with the aircraft. Comco Ikarus specifically disclaims any responsibility for any damage, whether or not to Comco Ikarus equipment, caused in any way by the use of the aircraft, parts or accessories when such parts or accessories are not manufactured or supplied by Comco Ikarus.

What is not covered by the warranty

This warranty is not valid if the defects are due to damage, misuse, tampering, neglect or lack of care and in case of alterations or repair carried out by unauthorized persons.

The following are examples of defects or damage not covered by this product warranty

1. Defects or damage resulting from use of the aircraft in other than is normal and customary manner.

2. Defects or damage from misuse, access to incompatible sources, accident or neglect.

3. Defects or damage from inproper testing, operation, maintenance, installation, adjustment or any alteration or modification of any kind.

4. Aircraft disassembled or repaired other than by Comco Ikarus or an IFC / ISC in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.

5. All plastic surfaces and all other externally exposed parts that are scratched or damaged due to customer normal use.

6. Periodic maintenance and repair or replacement of parts due to normal wear and tear.

Appendix:

Placards

Topic	**Location**
Aerobatics warning	Instrument panel
Trim	Roof frame
Flaps, mechanical	Roof frame
Engine oil specifications	Oil control cap
Fuel specifications	Fuel filler cap
Baggage loading opening	Baggage compartment
Deviation table	Instrument panel
Levers - Choke - Heating - Carburettor heat	Center console
Fuel valve	Center console
Data placard	Center console
Type placard, fire-resistant	Fuselage tube, behind tank

Data placard

Type: IKARUS C 42 B

Manufacturer:COMCO IKARUS GmbHD-88367 Hohentengen/Germany

Serial No.: _____

Year of production: _____

Never-exceed speed	116 kts (216 km/h)
Stall speed	35 kts (65 km/h)
Structural limitations	
positive limit load factor:	4 g
negative limit load factor:	2 g

Load limits:

Maximum take-off weight:	1041 lbs (472.5 kg)
Minimum useful load	143 lbs (65 kg)

Useful load according to flight manual page 17 and 18

Service Problem Report Form

UL Aircraft Type: _____ Serial No._____

Year of Manufacture: _____ Engine Type_____

Manufacture _____

Owner: _____

Registration No. _____

Total Flight Hours until Defect: _____

Engine: _____

Airframe: _____

Total Flight Hours (Pilot) on UL Aircraft: _____

Description of Damage:

_____

_____

_____

Damage Report:

_____

_____

Name:_____

Date:_____ Signature:_____

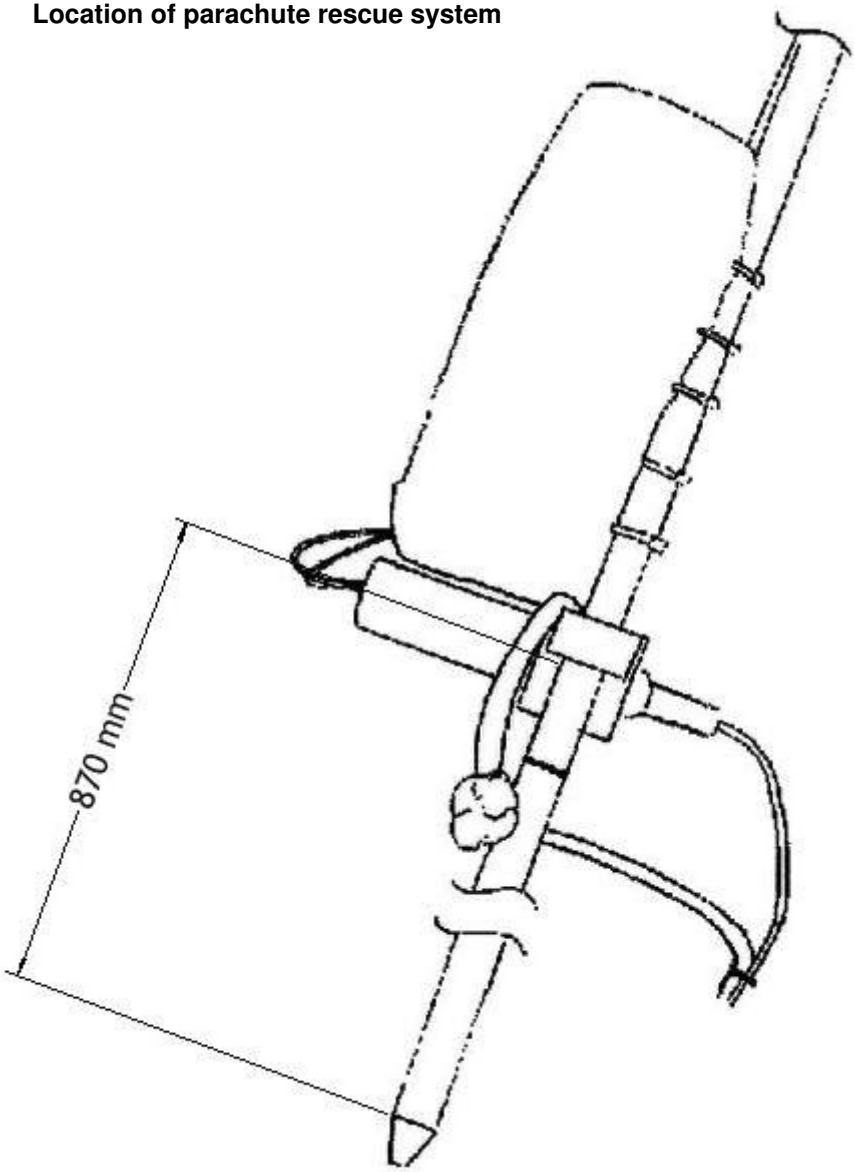
C 42 Flight Manual

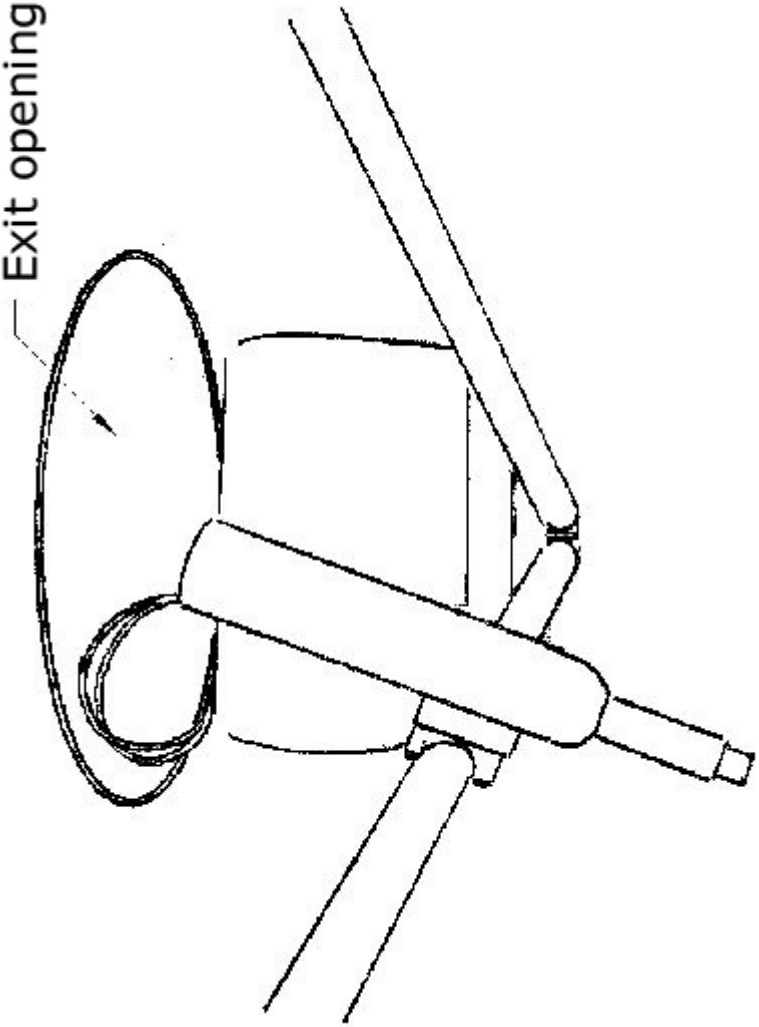
Inspections performed

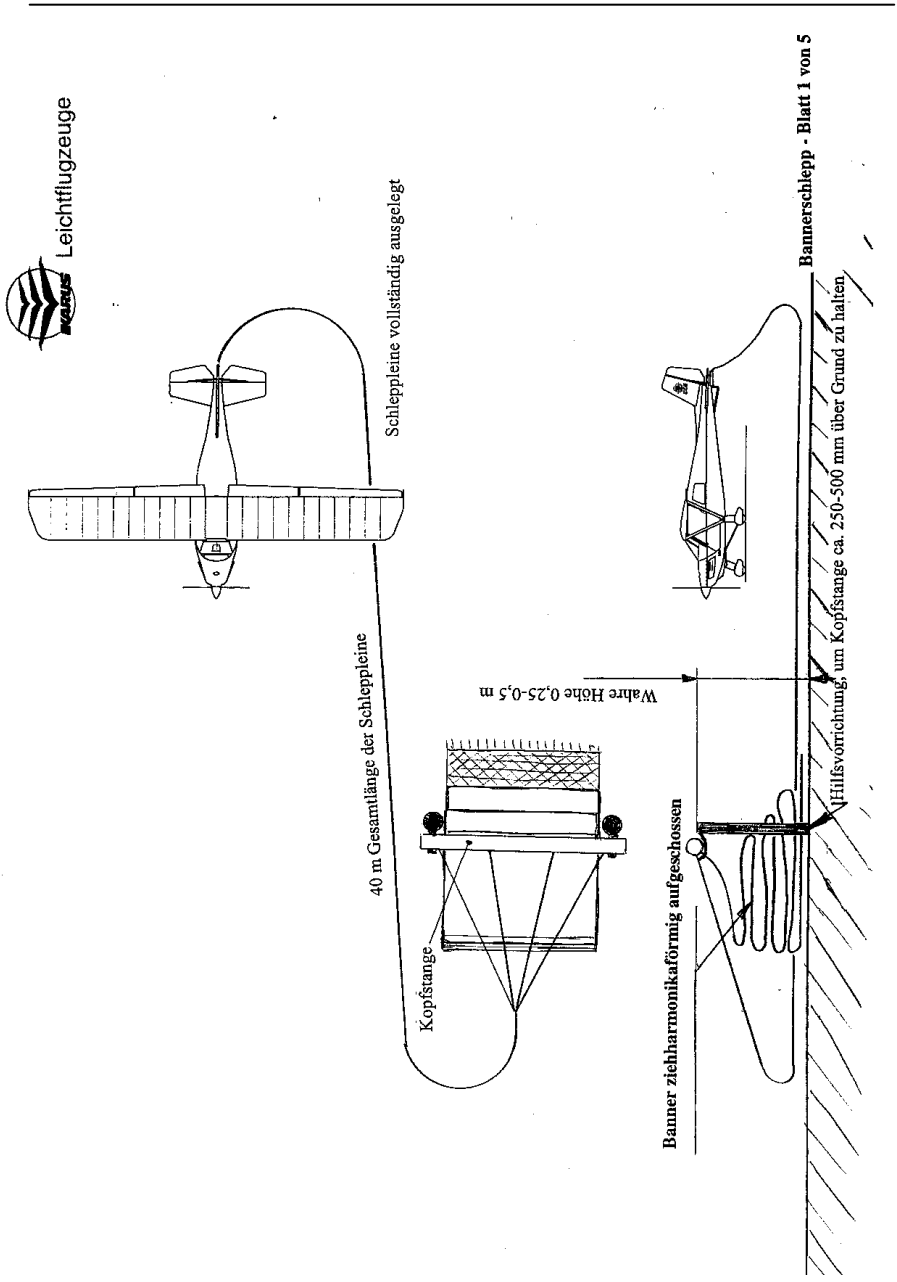
Type: C 42 B Serial No._____ _____Registration No:

Date	Type of inspection	Recognised expert

Location of parachute rescue system




Exit opening


Leichtflugzeuge
Schleppleine vollständig ausgelegt
40 m Gesamtlänge der Schleppleine
Kopfstange
Wahre Höhe 0,25-0,5 m
Bannerschlepp - Blatt 1 von 5
Hilfsvorrichtung, um Kopfstange ca. 250-500 mm über Grund zu halten
Banner ziehharmonikaförmig aufgeschossen

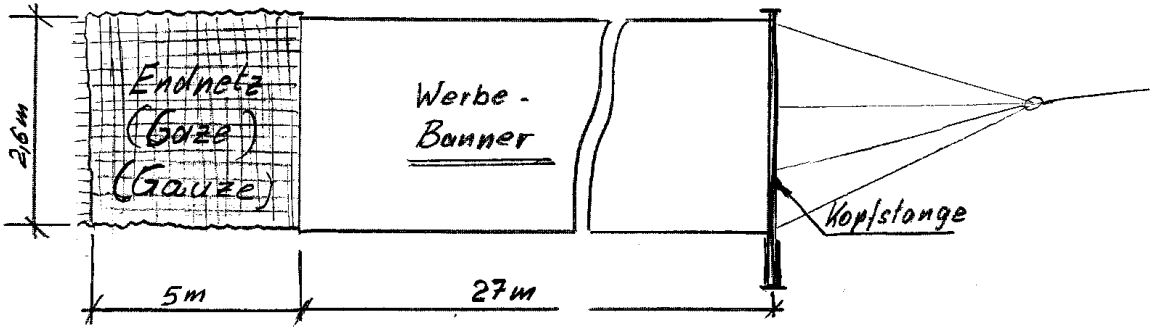
Bannerschlepp – Blatt 2 von 5

Leichtflugzeuge

Bannerschlepp – Blatt 3 von 5

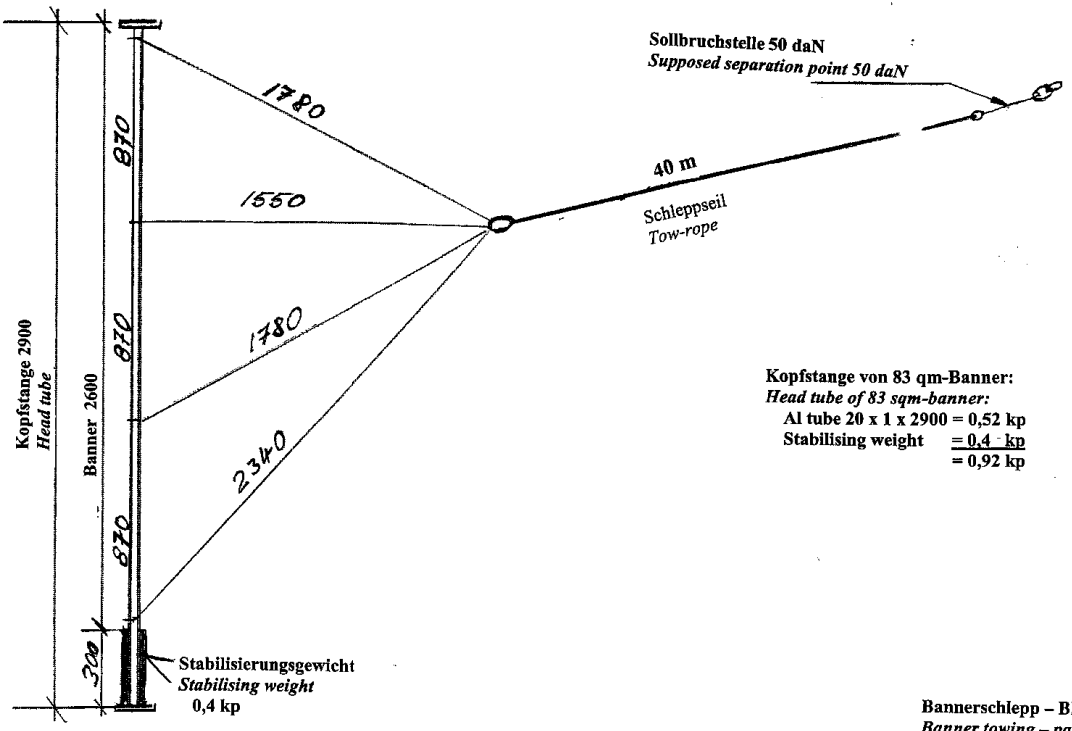
Leichtflugzeuge

Schlepp-Banner 83,2 m² 12 Kp



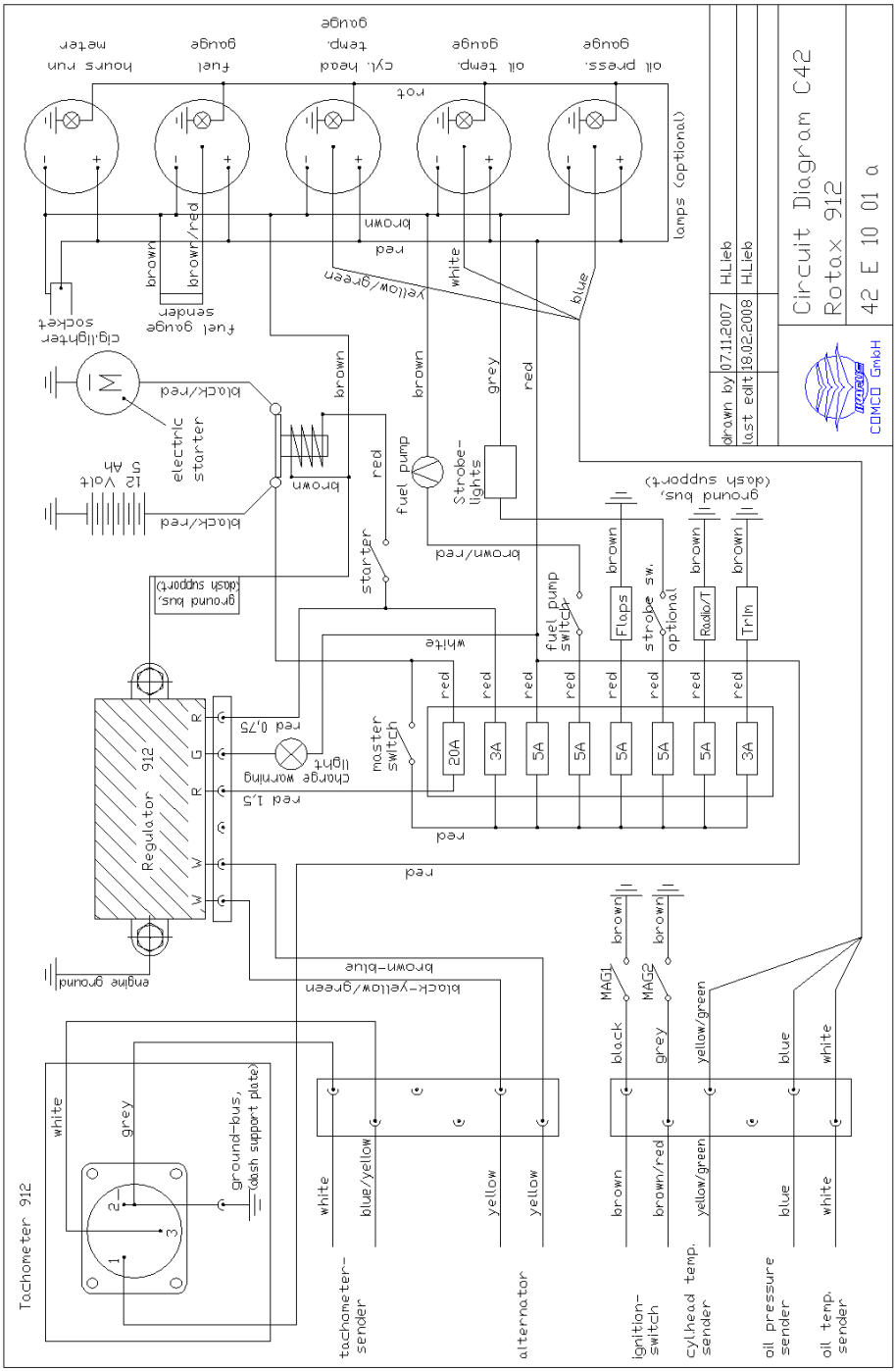
Bannerschlepp – Blatt 4 von 5

Leichtflugzeuge



Kopfstange von 83 qm-Banner:
Head tube of 83 sqm-banner:
Al tube 20 x 1 x 2900 = 0,52 kp
Stabilising weight = 0,4 kp
= 0,92 kp

Bannerschlepp – Blatt 5 von 5
Banner towing – page 5 of 5


Circuit Diagram C42
Rotax 912
42 E 10 01 a
drawn by 07.11.2007 HLieb
last edit 18.02.2008 HLieb
COMCO GmbH
lamps (optional)
oil press. gauge
oil temp. gauge
cyl. head temp. gauge
fuel gauge
hours run meter
fuel gauge sender
cig.lighter socket
electric starter
12 Volt 8Ah
fuel pump
Strobe-lights
starter
fuel pump switch
strobe sw. optional
Flops
Radio/T
Trim
ground bus, (dash support)
master switch
charge warning light
Regulator 912
engine ground
Tachometer 912
ground-bus, (dash support plate)
tachometer-sender
alternator
ignition-switch
cylhead temp. sender
oil pressure sender
oil temp. sender
MAG1
MAG2